REMARKS

Status of the claims

Claims 1-25 are pending and claims 1-8 are under consideration in this application, claims 9-25 having been withdrawn from consideration for allegedly being drawn to separate inventions. All the claims under consideration stand rejected. All claim amendments made herein serve only to enhance clarity and add no new matter. The amendments to claims 1 and 2 are supported by the specification (e.g., page 19, line 17, to page 22, line 11). The amendment to claim 5 is supported by the specification (e.g., page 18, lines 19-23) and add no new matter. After entry of the amendments made herein, claims 1-25 will be pending and claims 1-8 will be under consideration in this application.

35 U.S.C. § 103(a) rejections

(a) Claims 1-4, 6, and 7 stand rejected as allegedly being unpatentable over Vijg et al. (the '176 patent), taken in view of *In re Venner*. Applicants respectfully traverse the rejection.

Applicants understand from the comments on page 2, line 22, to page 3, line 17, of the Office Action the Examiner's position to be that the '176 patent discloses the two-dimensional (2-D) electrophoretic separation of restriction fragments and that, in view of this disclosure and the holding of *In re Venner* that automation of a manual activity is obvious, it would have been obvious to one of skill in the art at the priority date of the instant application to have used a computer to carry out the process specified by claim 1. Applicants disagree with this position.

Applicants respectfully submit that the method specified by the instant claims cannot be considered a mere automation of the methods disclosed by the '176 patent.

The '176 patent does not explicitly disclose any comparison between 2-D electrophoretic patterns. However, it is implicit from the '176 patent that its methods of analyzing DNA involve comparing the positions of "spots" in one actual 2-D electrophoretic gel pattern to the positions of spots in one or more other actual 2-D electrophoretic gel patterns (see, for example, column 6, lines 23-61); no information regarding the sequences of the analyzed DNA is utilized for any purpose, let alone for the purpose of generating a control 2-D electrophoretic pattern.

On the other hand, in the method facilitated by the program specified by the instant claims, the spots in an actual ("target") 2-D electrophoretic gel pattern are compared to virtual spots in a virtual ("control") 2-D electrophoretic gel in which the 2-D positions of the virtual spots are determined by analyzing genomic nucleotide sequence information (e.g., page 9, line 6, to page 24, line 7). The generation of the control 2-D electrophoretic gel pattern involves no physical handling of DNA at all, let alone actual 2-D electrophoresis. Thus, the control 2-D electrophoretic gel pattern is generated in a manner that is both conceptually and physically entirely different from actual 2-D electrophoretic gel generation. Hence the program of the instant claims cannot be considered a mere automation of the method of the '176 patent.

Applicants submit moreover that the invention of the present claims is in no way comparable to the subject matter of the claims at issue in *In re Venner*, 262 F.2d 91 (CCPA 1958), in which the Court of Customs and Patent Appeals held, as had the Board of Appeals at the United States Patent Office, the claims of the relevant patent application obvious over the prior art.

In the patent application at issue in *In re Venner* (the "Venner application") an apparatus for molding trunk pistons composed of aluminum and magnesium alloys was claimed (*In re Venner*, 262 F.2d 91,92). The applicants of the Venner application stated that the novelty of their apparatus lay only in a timing device that is activated by an operator when the molten alloy is poured into the mold and which, when the time set by the operator on the time is reached, causes the mold to automatically partially dismantle (*In re Venner*, 262 F.2d 91,92). It was known in the prior art that in molding such alloys (including in molding trunk pistons using such alloys), it was important to partially dismantle the mold soon after the solidification of the molten alloy and thus that the time between pouring the molten alloy into the mold and partially dismantling the mold was critical (*In re Venner*, 262 F.2d 91,93). In addition, the timer in the apparatus of the Venner application does not determine when the dismantling should occur; the operator sets the timer to perform the operation at a time decided by the operator (*In re Venner*, 262 F.2d 91,95). Moreover, in a prior art patent reference describing a die casting machine also involving molding of a molten aluminum alloy, it was taught that a timer is actuated to open the

die and discharge the casting (*In re Venner*, 262 F.2d 91,93). In sum, in the Venner application, a step identical to that in prior art apparatuses is performed, except that it is performed automatically rather than manually.

However, as pointed out above, the control 2-D electrophoretic gel pattern of the present claims is generated in a manner that is both conceptually and physically entirely different from actual 2-D electrophoretic gel generation (as disclosed by the '176 patent). Therefore, the claims at issue in the present application are distinguishable from those at issue in *In re Venner* and the holding of *In re* Venner is thus not applicable to the present claims.

In light of the above considerations, the instant claims are not obvious over the '176 patent in view of *In re Venner*.

(b) Claims 1-8 stand rejected as allegedly being unpatentable over Vijg et al. (the '176 patent), taken in view of *In re Venner*, and further in view of Stevens et al. (the '767 patent).

The '767 patent describes a networked system comprising a central computer connected to a plurality of nucleic acid sequencing machines (see, e.g., the Abstract).

For the reasons given above, claim 1, and thus also claims directly or indirectly dependent on it, are not obvious over the '176 patent and *In re Venner*. Moreover, in that it contains no teaching to suggest that the claimed program is merely an automation of the method described in the '176 patent, the '767 is patent does not remedy the deficit in the two references. Thus, neither claim 1, nor any of the claims dependent on it, are obvious over the '176 patent, taken in view of *In re Venner*, and further in view of Stevens et al. (the '767 patent).

Moreover, Applicants wish to draw the Examiner's attention to additional indicia of non-obviousness in claims 5 and 8 in light of the cited art. As acknowledged by the Examiner, the combination of the '176 patent and *In re Venner*, does not teach "communications over a network (instant claim 5) or memorization of sequence data (instant claim 8)" (Office Action, page 4, lines 1-3). However, contrary to the assertions of the Examiner on page 4, lines 4-10, of the Office Action, the '767 patent does not disclose or even suggest the embodiments of present claims 5 and 8.

The "communication line network" of instant claim 5 is used for obtaining genomic nucleotide sequence information from a genetic sequence database (e.g., page 18, lines 19-23 of the specification) while the network of the '767 patent is used for sending sequence information from a plurality of sequencing machines to a central computer for storage (see, e.g., the Abstract). The '767 patent neither discloses, nor even suggests, the "communication line network" recited by claim 5.

Claim 8 specifies how the "abnormal information" referred to in claim 7 can be used in the process facilitated by the claimed program. The term "abnormal information", as used in the instant application, refers to positions in genomic sequences (used for generation of the control 2-D electrophoretic gel pattern) that are unidentified (see instant specification, e.g., at page 19, lines 5-16). None of the cited references mentions, or even suggests, such "abnormal information" for any purpose, let alone in the context of a control 2-D electrophoretic gel as specified in the instant claims.

Thus, the above considerations provide grounds for the non-obviousness for claims 5 and 8 in addition to the ground that they, like parent claim 1, are not directed to a mere automation of a prior art manual method (see argument above).

In view of the above factors, Applicants respectfully request that the rejections under 35 U.S.C. §103(a) be withdrawn.

CONCLUSION

In summary, for the reasons set forth above, Applicants maintain that the pending claims patentably define the invention. Applicants request that the Examiner reconsider the rejections as set forth in the Office Action, and permit the pending claims to pass to allowance.

If the Examiner would like to discuss any of the issues raised in the Office Action, Applicants' undersigned representative can be reached at the telephone number listed above.

Please apply any charges or credits to Deposit Account No. 06-1050, referencing Attorney Docket No. 11283-015001.

Respectfully submitted,

Date: 6/9/04

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